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Attorney's Do. No. 4430-18

## IN THE UNITED STATES PATENT AND TRADEMARK OFFICE

In re Patent Application of: Andrew D. Barofsky &amp; Kenton W. Gregory

Serial No. 08/797,770 Group Art Unit: 3738

Filing Date: February 7, 1997 Examiner: Paul Prebilic

For: METHOD FOR USING TROPOELASTIN AND FOR PRODUCING  
TROPOELASTIN BIOMATERIALSAssistant Commissioner for Patents  
Washington, D.C. 20231**DECLARATION UNDER 37 C.F.R. 1.132**

I, Kenton W. Gregory, hereby declare,

I received a Doctorate of Medicine from the University of Southern California, School of Medicine (Los Angeles, CA) in 1980 and that I have been the Director of the Oregon Medical Laser Center of Portland, Oregon since 1991 (copy of curriculum vitae attached hereto as Exhibit A).

I am an inventor in the above referenced patent application and am familiar with the development, usage, and properties of elastin-based biomaterials. In my opinion the elastin containing composition disclosed in Rabaud et al (US 5,223,420) is distinguishable from the tropoelastin-based polymer claimed in the above referenced patent application for the following reasons:

1. Rabaud et al. does not relate the use or production of an elastin or tropoelastin composition except wherein fibrin is an essential component of that composition.
2. Fibrin is included in the composition disclosed in Rabaud et al. because the fibrin is necessary to crosslink or polymerize the elastin into a matrix.
3. The presence of fibrin in the composition disclosed in Rabaud et al. makes it thrombogenic. Thus, as stated by Rabaud, "it is not possible to use the material as artery substitute because of its natural thrombogenicity". See M. Rabaud et al., *A New Biodegradable Elastin-Fibrin Material; Its Use in Urological, Digestive, and Cardiovascular Surgery*, 7 J. Biomaterials Applications 20, 44 (1992).

4. Unlike Rabaud et al., the invention described by the present application does not contain fibrin and, therefore, should make possible tissue prostheses that are suitable for numerous *in vivo* uses.

I hereby declare that all statements made herein of our own knowledge are true and that all statements made on information and belief are believed to be true; and further that these statements were made with the knowledge that willful false statements and the like so made are punishable by fine or imprisonment, or both, under Section 1001 of Title 18 of the United States Code, and that such willful false statements may jeopardize the validity of the application or any patent issued thereon.

Inventor's signature



Kenton W. Gregory

Dated: 6/23/99

Citizenship: United States of America  
Residence: 3737 Council Crest  
Portland, OR 97270

# CURRICULUM VITAE

KENTON W. GREGORY, M.D.

**HOME ADDRESS:** 3737 Council Crest  
Portland, OR 97270

**DATE OF BIRTH:** December 27, 1954

**PLACE OF BIRTH:** Salem, Oregon

**EDUCATION:**

1976-1980 University of Southern California, School of Medicine  
Los Angeles, CA

1972-1976 University of Southern California, School of Engineering  
Los Angeles, CA

**POSTDOCTORAL TRAINING:**

1985-1986 Research Fellowship in Cardiology  
University of California, Irvine Medical Center  
Orange, California

1983-1985 Fellowship in Cardiology  
Wadsworth Veterans Administration Hospital  
Los Angeles, CA  
University of California, School of Medicine  
Los Angeles, CA

1980-1983 Internship and Residency in Internal Medicine  
Wadsworth Veterans Administration Hospital  
Los Angeles, CA  
University of California, School of Medicine  
Los Angeles, CA

**LICENSURE AND CERTIFICATION:**

1980 Doctorate in Medicine

1981 California License Registration

1983 American Board of Internal Medicine, Diplomate

1985 American Board of Internal Medicine, Diplomate  
(Subspecialty in Cardiovascular Diseases)

1986 State of California X-ray Supervisor Certificate

1988 Massachusetts License Registration

1991 Oregon License Registration

**ACADEMIC APPOINTMENTS:**

1985-1986	Clinical Instructor in Medicine University of California at Irvine Medical Center
1986-1987	Assistant Clinical Professor in Medicine University of California at Irvine Medical School
1987-1990	Instructor in Medicine Harvard University School of Medicine
1991-Present	Assistant Professor of Medicine Oregon Health Sciences University
1992-1995	Professor Biomedical Science and Engineering
1993-Present	Associate Professor in the Department of Electrical Engineering Oregon Graduate Institute of Science and Engineering

**HOSPITAL APPOINTMENTS:**

1985-1987	Staff Cardiologist University of California at Los Angeles Center for Health Sciences
1986-1987	Staff Cardiologist University of California Irvine Medical Center Orange, CA
1984-1987	Staff Cardiologist Westside Hospital Los Angeles, CA
1987-1988	Clinical Assistant in Cardiology Massachusetts General Hospital Boston, MA
1991-Present	Assistant Professor of Medicine (Cardiology) Oregon Health Sciences University Portland, OR
1991-Present	Staff Cardiologist Providence St. Vincent Hospital and Medical Center Portland, OR

**OTHER PROFESSIONAL POSITIONS:**

1974-1976	Student Investigator United States Energy Research and Development Agency University of Southern California
1975-1976	Production Engineer in Secondary and Tertiary Recovery Systems Shell Oil Company
1976-1977	Consultant, Medical Data Management Corporation

(Other professional positions cont'd)

1983-1984	Clinical Investigator, Smith, Kline and French
1985-1986	Clinical Investigator, Pfizer Laboratories
1987-1989	Investigator in Cardiovascular Laser Research Wellman Laboratory of Photomedicine Massachusetts General Hospital
1989-1991	Editorial Consultant Lasers in Surgery and Medicine American Journal of Cardiology
1991-Present	Director, Oregon Medical Laser Center Providence St. Vincent Hospital and Medical Center Portland, OR
1991-Present	Chairman, Laser Advisory Board Providence St. Vincent Hospital

**AWARDS AND HONORS:**

1976	Sigma Xi, Award for Outstanding Original Research
1976	Tau Beta Pi
1976	Outstanding Upperclassman in Chemical Engineering American Institute of Chemical Engineers
1978	ARCS Scholarship Award

**GRANTS:**

1987	Principal Investigator, NIH-SBIR
1989	Women's Heart Association Grant
1991	The Collins Foundation Grant
1994	M.J. Murdock Charitable Trust Grant
1994	St. Vincent Medical Foundation Grant
1995	The Collins Foundation Grant
1996	US Armed Forces Grants, No. DAMD17-96-1-6006

**MAJOR COMMITTEE ASSIGNMENTS:**

1986	Medical School Admissions Committee University of California at Irvine Medical School
1994-Present	The Laser Microbeam and Medical Program External Advisory Board, NIH -BRTP

(Major committee assignments cont'd)

1995                   Heart Institute Advisory Committee  
                          Heart Institute, Providence St. Vincent Hospital and Medical Center

**MEMBERSHIP, OFFICES, PROFESSIONAL SOCIETIES:**

1976                   Tau Beta Pi  
1978                   Archimedes Circle  
                         University of Southern California School of Engineering  
1979                   American Medical Association  
1980                   American College of Physicians  
1982                   American College of Cardiology (Fellowship Applicant)  
1986                   American Heart Association  
1988                   Fellow American Society for Laser Medicine and Surgery  
1992                   Fellow, SPIE  
1992-1997             Chairman, SPIE Cardiovascular Section  
1995                   Editorial Board, Lasers in Surgery and Medicine  
1996                   Member, American Association for the Advancement of Science  
1996                   Member, American Society for Photobiology ad Photochemistry  
1995-1997            Chairman, Engineering Foundation  
1997                   Chairman, American Society for Lasers in Medicine and Surgery,  
                         Cardiovascular Section

**MAJOR RESEARCH INTERESTS:**

- 1 ) Application of laser energy for the treatment of atherosclerotic vascular disease
- 2 ) Laser Thrombolysis in acute myocardial infarction and stroke.
- 3 ) Vascular smooth muscle response to light.
- 4 ) Elastin biomaterials for tissue replacement and repair.
- 5 ) Dye-targeted laser-tissue fusion.

**TEACHING EXPERIENCE:**

1985-1986           Undergraduate and graduate courses in preventive cardiology and  
                         cardiac rehabilitation, UCLA Medical Center

(Teaching experience cont'd)

1986-1987	Attending Physician, University of California, Irvine Medical Center Cardiology Clinical Service, Cardiac Catheterization Laboratory, Electrocardiography ad Ultrasonic Imaging (For Fellows, Residents, and Medical Students)
1985-1987	Undergraduate course in cardiovascular research. Postdoctoral instruction in cardiovascular laser research University of California at Irvine Medical Center
1987-1990	Cardiac Visit Cardiac Catheterization Laboratory, Massachusetts General Hospital (Cardiac Fellows)
1988-1990	Lecturer and Thesis Advisor, Massachusetts Institute of Technology Health Science and Technology Program
1991-Present	Cardiac Visit Cardiac Catheterization Laboratory, Oregon Health Sciences University
1991-Present	Attending Physician, Cardiology Clinical Services, Oregon Health Sciences University
1991-Present	Lecturer, Oregon Graduate Institute of Science and Technology
1995	Thesis Advisor, Oregon Graduate Institute of Science and Technology <i>"Tissue Welding: Studies of Pulsed Diode Laser Interaction with ICG Stained Porcine Aorta and Elastin-Based Biomaterial"</i> Masters Thesis, Elaine N. La Joie, 1995.
1996	Thesis Advisor, Oregon Graduate Institute of Science and Technology <i>"Mechanical Strength Studies of Steady-State Thermal and Pulsed Laser Tissue Welding"</i> Master Thesis, K.S. Kumar, 1996.
1996	Thesis Advisor, Oregon Graduate Institute of Science and Technology <i>"Laser Thrombolysis: Basic Ablation Studies,"</i> Masters Thesis, Ujwal S., 1996.

**PRINCIPAL CLINICAL AND HOSPITAL SERVICE RESPONSIBILITIES:**

1983-1985	Director of Cardiac Rehabilitation, Wadsworth Veterans Hospital
1984-1985	Medical Director, Division of Preventative Cardiology and Cardiac Rehabilitation, Center for Health Enhancement, Education and Research, UCLA
1985-1987	Member, Cardiovascular Laser Research Group Beckman Laser Institute
1985-1987	Attending Physician Cardiac Unit, Cardiac Catheterization Laboratory, Massachusetts General Hospital
1986-1987	Associate Medical Director, Executive Wellness Program, University of California Irvine Medical Center

(Principal clinical and hospital service responsibilities cont'd)

- |              |   |
|--------------|---|
| 1987-1990    | Attending Physician Cardiac Unit, Cardiac Catheterization Laboratory, Massachusetts General Hospital                                      |
| 1987-1990    | Cardiology Laser Research, Wellness Laboratories of Photomedicine, Massachusetts General Hospital   |
| 1991-1995    | Attending Cardiologist, Cardiac Catheterization Laboratories and Coronary Care Units, Oregon Health Sciences University, Portland, Oregon |
| 1995-Present | Attending Cardiologist, C-service, Internal Medicine, Providence St. Vincent Hospital and Medical Center, Portland, Oregon                |
| 1993-Present | Chairman, Laser Advisory Committee, Providence St. Vincent Hospital, Portland, Oregon   |

#### **PRINCIPAL INVESTIGATOR/FDA SPONSORED CLINICAL TRIALS:**

##### **"Coronary artery Laser Thrombolysis"**

Phase I, Single Center Trials, April '91-Jan '93, St. Vincent Hospital, Portland, OR, Phase II, MultiCenter Trials, July '94-May '96, St Vincent Hospital, Portland, OR, Methodist Hospital, Lubbock, TX, Washington Hospitals, Washington DC, Scripps Clinic, LaJolla, CA

##### **"LAIS saline perfusion excimer laser angioplasty"**

Multi-Center Trials, May '92-May '96, Providence St. Vincent Hospital, Portland, OR, Cleveland Clinic Hospitals, Cleveland, OH, Washington Adventist Hospital, Tacoma Park, MD, University of Washington Hospitals, Seattle WA

#### **BIBLIOGRAPHY**

##### **ORIGINAL REPORTS:**

LaMuraglia BM, Walsh JT, Prince MR, Gregory KW: Differential ablation of arterial wall components with a pulsed CO<sub>2</sub> laser. *Surgical Forum*, 39:311-313, 1988.

Gregory KM, Anderson RR: Liquid core light guide for laser angioplasty. *IEEE J. of Quant Electron.*, 26:2289-2296, 1990.

Gregory KW, Prince MR, LaMuraglia GM, Flotte T, Buckley LA, Tobin J, Ziskind AA, Caplin J, Anderson RR: Effect of blood upon selective ablation of atherosclerotic plaque with a pulsed dye laser. *Lasers in Surgery and Medicine*, 10:533-543, 1990.

Teramura A, MacFarlane R, Owen CJ, de la Torre R, Gregory KW, Parrish JA, Zervas NT: Application of the 1-microsecond pulsed dye laser to the treatment of experimental cerebral vasospasm. *J. Neurosurg.*, 75: 271-276, 1991.

MacFarlane R, Teramura A, Owen CJ, Chase S, de las Torre R, Gregory KW, Parrish JA, Zervas NT: Treatment of vasospasm with 480 nm pulsed-dye laser. *J. Neurosurg.*, 75:613-622, 1991.

Aretz HT, Gregory KW, Martinelli MA, Gregg RE, LeDet RE, Hatch GF, Sedlacek T, Haase WC: Ultrasound guidance of laser atherectomy. *Intl J. Cardiac Imaging*, 6:231-237, 1991.

(Original reports cont'd)

Huang D, Swanson EA, Lin CP, Shuman JS, Stinson WG, Chang W, Hee MR, Flotte T, Gregory KW, Puliafito CA, Fujimoto JG: Optical coherence tomography. *Science*, 254:1178-1181, 1991.

Schwengel RH, Gregory KW, Hearne SE, Scott HJ, Beauman GJ, Mergner WJ, Caplin JL, Ziskind AA: Characterization of pulsed-dye laser mediated vasodilation in a rabbit femoral artery model of vasoconstriction. *Lasers in Surgery and Medicine*, 13:284-295, 1993.

Chaudhry H, Lynch M, Schomacker K, Birngruber R, Gregory KW, Kochevar I: Relaxation of vascular smooth muscle induced by low-power radiation. *Photochemistry & Photobiology*, 58:661-9, 1993.

Girouard ST, Pastore JM, Laurita KR, Gregory KW, Rosenbaum DS: Optical mapping in a new guinea pig model of ventricular tachycardia reveals mechanisms for multiple wavelengths in a single recalcitrant circuit. *Circulation*, 93:603-613, 1996.

Shangguan H, Casperson LW, Shearin A, Gregory KW, Prahl SA: Drug delivery with microsecond laser pulses into gelatin. *Applied Optics*, 35:3347-3357, 1996.

#### REVIEWS, CHAPTERS, EDITORIALS:

Shaw PM, Gregory KW: Myocarditis; Cardiomyopathies. In: *Internal Medicine*. Stein JH, Boston. Little, Brown and Company, 1988.

Gregory KW: Laser Thrombolysis. In: *International Cardiology*. J. Vogel, 2nd Edition. Little, Brown and Company, 1993.

Gregory KW: Laser Thrombolysis. In: *International Cardiology*. E. Topol, 2nd Edition. W.B. Saunders Company, 1994.

Gregory KW: Laser Thrombolysis in Acute Myocardial Infarction. In: *Current Review of Interventional Cardiology*. D. Holmes, Jr. and P. Serruys, 3rd Edition. Current Medicine Publishers, (In Press).

#### CONFERENCE PAPERS:

Waltenberger J, Jacques S, Gregory KW: Optical properties of arterial thrombi and arterial wall in the visible spectrum: basis for pulsed dye laser thrombolysis. *European Congress of Cardiology*, 1990.

Teramura A, MacFarland R, Owen C, De la Torre R, Gregory KW, Parrish JA, Zervas N: Pulsed dye laser of experimental cerebral vasospasm. *Proceedings of International Conference of Cerebral Vasospasm*, 1990.

Gregory KW, Anderson RR: Fluid core optical transmission for laser angioplasty. *SPIE Proceedings: Optical Fibers in Medicine*. 1201:156-161, 1990.

Gregory KW, Aretz HT, Martinelli MA, Ledet EG, Hatch GF, Gregg RE, Sedlacek T, Haase WC: Intraluminal laser atherectomy with ultrasound and electromagnetic guidance. *SPIE Proceedings: Diagnostic and Therapeutic Cardiovascular Interventions*, (George Abela, ed.) 1425:217-225, 1991.

(Conference papers cont'd)

Shangguan H, Haw TE, Gregory KW, Casperson LW: Novel cylindrical illuminator for ultraviolet light delivery. *SPIE Proceedings: Diagnostic and Therapeutic Cardiovascular Interventions III*, (George Abela, ed.) 1878:167-182, 1993.

Jacques SL, Buckley L, Prahl SA, Gregory KW: Quantifying psoralen in tissue by fluorescence: dosimetry for PUVA to block restenosis. *SPIE Proceedings: Diagnostic and Therapeutic Cardiovascular Interventions IV*, (George Abela, ed.) 2130:82-88, 1994.

Shangguan H, Casperson LW, Shearin A, Gregory KW, Prahl SA: Photoacoustic drug delivery; the effect of laser parameters on spatial distribution of delivered drug. *SPIE Proceedings: Laser-Tissue Interaction VI*, (Steven Jacques, ed.) 2391:394-402, 1995.

LaJoie EN, Barofsky AD, Gregory KW, Prahl SA: Welding artificial biomaterial with a pulsed diode laser and indocyanine green. *SPIE Proceedings of Lasers in Surgery: Advanced Characterization Therapeutics and Systems V*, (R. Rox Anderson, ed.) 2395:508-516, 1995.

Shangguan H, Casperson LW, Shearin A, Gregory KW, Prahl SA: Photoacoustic drug delivery: The effect of laser parameters on spatial distribution of delivered drug. *SPIE Proceedings of Laser-Tissue Interaction VI*, (S.L. Jacques, ed.) 2391:394-402, 1995.

#### PUBLISHED ABSTRACTS:

Boltwood C, Rieders D, Gregory KW: Inspiratory tracking sign in pericardial disease. *Circulation (Suppl. II)* 70:1-103, 1984.

Gregory KW, Johnston WD, Nahais RA, Mallory JA, Grandaw P, Berns MW, Henry WL: Coronary laser angioplasty in an atherosclerotic human xenograft - swine model. *Lasers in Surgery and Medicine*, (Suppl.) 7:86, 1987.

Johnston WD, Gregory KW, Nahais R, Sato D, Berkley R, Mallory J, Henry WL: Percutaneous coronary laser angioplasty in a large animal model of human coronary atherosclerosis. *JACC (SUPPL. A)* 9:104A, 1987.

Mallory J, Gregory KW, Morcos C, Griffith J, Henry W: Evaluation of a balloon angioplasty intravascular ultrasonic imaging device. *Circulation (Suppl. II)* 76:11-371, 1987.

Gregory KW, Burgus BO, Grandaw PC, Anderson RR: Pulsed laser induced vasodilation and vasospasm. *Circulation (Suppl. II)* 78:11-295, 1988.

Radtke W, Anderson RR, Guerrero L, Gregory KW, Parrish JA: Laser balloon angioplasty of the ductus artery for palliative shunting. *Circulation (Suppl. II)* 78:11-100, 1988.

Gregory KW, Anderson RR: Iodinated contrast fluid can replace quartz in laser catheters. *Circulation (Suppl. II)* 80:11-107, 1989.

Gregory KW, Flotte TW, Michaud N, Fallon JT: Laser-induced inhibition of platelet adhesions. *Circulation (Suppl. II)* 80:11-344, 1989.

Gregory KW, Guerrero JL, Girskey M, Suizzero T, Flotte TW, Parrish JA: Coronary artery laser thrombolysis in acute canine myocardial infarction. *Circulation (Suppl. II)* 80:523, 1989.

(Published abstracts, cont'd)

Prince MR, LaMuraglia GM, Flotte TW, Eggin T, Gregory KW, Athanasoulis CA: Selective laser angioplasty at 480 nm with ball-tipped fibers in amputated human legs. *RSNA Scientific Program*, 173: 148, 1989.

Chaudhry HW, Kochevar IE, Schomaker KT, Cooke JP, Birngruber R, Gregory KW: Laser induced vasorelaxation: An action spectrum from 337 nm to 630 nm. *Circulation (Suppl. III)* 82:111-408, 1990.

Gregory KW, Martinelli MA, Aretz TH, Butterly JR: Intravascular ultrasound-guided holmium laser atherectomy. *Circulation (Suppl. III)* 82:111-677, 1990.

Gregory KW, Walsh AA, Schomaker KT, Kochevar IE: Excimer laser energy absorbed radiographic contrast media results in cytotoxic photoproducts. *Circulation (Suppl. III)* 82:111-2, 1990.

Ziskind AA, Caplan JL, Gregory KW: Vasodilation by pulsed laser requires the presence of a bloodfield. *Clinical Research*, 38:372A, 1990..

Grunkemeier JM, Gregory KW: Acoustic measurements of cavitation bubbles in blood, contrast and saline using an excimer laser: implications for laser atherectomy. *Lasers in Surgery and Medicine (Suppl.)* 4:16, 1992

Gregory KW, Buckley LA, Block PC: Laser thrombolysis in acute myocardial infarction-initial clinical results. *Lasers in Surgery and Medicine (Suppl.)* 4:17, 1992.

Schwengel RH, Beauman GJ, Mergner WJ, Gregory KW, Ziskind AA: "Pulsed dye laser irradiation can reverse and prevent surgical and pharmacologic vasoconstriction." *Lasers in Surgery and Medicine (Suppl.)* 4:19, 1992.

Gregory KW, Buckley LA, Haw TE, Grunkemeier JM, Chasteney EA, Qu Z, Bahlman DT, Fahrenbach H, Block PC: Photochemotherapy using psoralen and UVA light in a porcine model of intimal hyperplasia. *Circulation (Suppl. II)* 88:11-82, 1993.

Gregory KW, Block PC, Knopf WD, Buckley LA, Cates CU: Laser thrombolysis in acute myocardial infarction. *JACC (Suppl. A)* 21:A-298, 1993.

Gregory KW, Buckley LA, Haw TE, Grunkemeier JM, Chasteney EA, Bahlman DT, Fahrenbach H, Block PC: Photochemotherapy of intimal hyperplasia using psoralen activated by ultra-violet light in a porcine model. *Lasers in Surgery and Medicine (Suppl.)* 6:12, 1994.

Buckley LA, Jacques S, Prahl S, Gregory KW: Measurement of serum psoralen levels using fluorescence. *Lasers in Surgery and Medicine (Suppl.)* 6:1, 1994.

Chasteney EA, Ravichandran PS, Furnary AP, Floten HS, Bahlman DT, Gregory KW: Selective laser thrombolysis for arterial bypass thrombosis. *Lasers in Surgery and Medicine (Suppl.)* 10, 1994.

Chasteney EA, Prahl SA, Gregory KW: A simple model for the spectrophotometric determination of thrombosis ablation mass. *Lasers in Surgery and Medicine (Suppl.)* 6:62, 1994.

Shangguan H, Buckley L, Shearin A, Gregory KW: Integrated Laser Catheter System for Photodynamic Therapy. *Lasers in Surgery and Medicine (Suppl.)* 6:56, 1994.

(Published abstracts, cont'd)

Chasteney EA, Ravichandran PS, Furnary AP, Bahlman DT, Gregory KW: Laser thrombolysis for bypass graft thrombosis. *JACC* 22 (Suppl. A) 1:374A, 1994.

Gregory KW, Grunkemeier JM: Internal elastic lamina replacement with a new elastin stent biomaterial. *Circulation* (Suppl. II) 90:11-596, 1994.

Gregory KW, Grunkemeier JM: Arterial reconstruction using an elastin-based polymer with dye targeted diode laser fusion. *Lasers in Surgery and Medicine* (Suppl.) 7:22, 1995.

Chasteney EA, Ravichandran PS, Bahlman DT, Shearin A, Gregory KW: Rapid thrombolysis in experimental acute coronary artery bypass graft thrombosis. *JACC* 24 (Suppl.) 1:348, 1995.

Gregory KW: Novel cardiovascular applications in photobiology and photomedicine. *Photobiology and Photomedicine*, 63:1045, 1996.

Buckley LA, Gregory KW, Bahlman DT, Shangguan H, Fahrenbach H, Rosenthal E, Block PC: Photochemotherapy of intimal hyperplasia using psoralen activated by UV light in porcine model. *SPIE Proceedings Lasers in Surgery: Advanced Characterization, Therapeutics, and Systems VI* (R. Rox Anderson, ed.) 2671:78-83, 1996.

Girskey MJ, Gregory KW, Shearin A, Prahl SA: Photoacoustic drug delivery to arterial thrombus - a new method for local drug delivery. *Circulation* (Suppl.) 94:1-201, 1996.

**Invited Lecturer:**

**1993**

Transcatheter Cardiovascular Therapeutics - V, Washington D.C., "Laser Thrombolysis" and "Light-Activated Drug Therapy for Intimal Hyperplasia"

Arizona Heart Institute, Phoenix, AZ, "Laser Thrombolysis in Acute MI"

Future Directions in Cardiology, Santa Barbara, CA, "Update on Laser Thrombolysis in Acute MI"

LEOS '93, San Jose, CA, "Laser Angioplasty"

**1994**

Transcatheter Cardiovascular Therapeutics - VI, Washington D.C., "Laser Thrombolysis in Acute MI"

University of Cleveland Grand Rounds, Cleveland, OH, "A Liquid Core Light Guide to Treat Acute Coronary Thrombosis," "Laser-Tissue Interactions - The Basis of Practical New Applications in Cardiology"

Fourth European Workshop on Future Directions in Interventional Cardiology-Monaco, Sponsored by the Universite' de Lille Hopital Cardiologique, Lille, France, "Laser Thrombolysis: Principles, Methods, Experimental Studies"

(Invited lecturer, cont'd)

**1995**

Transcatheter Cardiovascular Therapeutics VII, Washington D.C., "Laser Thrombolysis"

CLEO/QELS '95, Baltimore, MD, "Novel uses of lasers in cardiology"

Future Directions in Lasers in Medicine & Surgery, Snowbird, UT, "Novel Laser Applications for Treatment of Vascular Restenosis"

Cardiovascular Interventions, Technology at the Summit V, Aspen, CO, "Laser Thrombolysis & Beyond"

Open Workshop on Optics in Health Care & The Life Sciences, Portland, OR, "Lasers in Cardiology"

Coronary Interventions, '95, Grande Torrey Pines, CA, "Laser Thrombolysis Update"

Optical Society of America, San Francisco, CA, "Novel Use of Lasers in Medicine":

Tillamook County General Hospital Medical Staff, Tillamook, OR, New Advances of Lasers in Medicine"

Regional Heart Institute, Portland, OR, "Lasers in Medicine - an Update"

City Club of Portland, "New Healthcare Technologies"

Heritage Club, Portland, Or, "New Advance of Laser in Medicine"

**1996**

SPIE, San Jose, CA, "Novel Uses of Lasers in Medicine"

Transcatheter Cardiovascular Therapeutics VIII, Washington D.C., "Laser Thrombolysis - From Concept to Clinical Application - an Update"

Restinosis Seminar, Cleveland, OH, "Psoralen Activated by UV Light for the Treatment of Intimal Hyperplasia in a Porcine Coronary Artery Model"

Photomedicine Lecture Series, Providence St. Vincent Hospital, Portland, OR, "Tissue Replacement & Repair Using an Elastin Biomaterial Deployed via Dye-Targeted Laser"

American Society for Photobiology, Atlanta, GA, "Novel Cardiovascular Applications in Photobiology and Photomedicine"

Kiwanis Club, Portland, OR, "Lasers in Medicine & Surgery"

Young Presidents Club, Portland, OR, "Novel Uses of Lasers in Medicine"

Union Pacific Foundation, Portland, OR, "Lasers in Medicine & Surgery"

Summerfield Lake Senior Center, Portland, OR, "Lasers in Medicine & Surgery"

Charboneau Senior Center, Portland, OR, "Lasers in Medicine & Surgery"

(Invited lecturer, cont'd)

Kiwanis Club, Tigard, OR, "*Lasers in Medicine & Surgery*"

Portland Surgical Society Meeting, Portland, OR, "*New Applications of Lasers In Surgery*"

PSU Student Body, Portland, OR, "*Tissue Replacement & Repair Using Elastin Biomaterials via Dye-Targeted Laser Fusion*"

Providence Milwaukie Hospital, Portland, OR, "*Lasers in Medicine & Surgery*"

Meyer Memorial Trust, Portland, OR, "*Elastin Update*"